



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/633,872	08/04/2003	Tyler A. Lowrey	ITO.0046US (P16201)	5269
21906 7590 02/15/2007 TROP PRUNER & HU, PC 1616 S. VOSS ROAD, SUITE 750 HOUSTON, TX 77057-2631			EXAMINER LE, THONG QUOC	
			ART UNIT	PAPER NUMBER
			2827	
SHORTENED STATUTORY PERIOD OF RESPONSE		MAIL DATE	DELIVERY MODE	
3 MONTHS		02/15/2007	PAPER	

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

**Office Action Summary**

Application No.

10/633,872

Applicant(s)

LOWREY ET AL.

Examiner

Thong Q. Le

Art Unit

2827

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 18 December 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1,3-7,9-14 and 16-19 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,3-7,9-14 and 16-19 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

### DETAILED ACTION

1. Amendment filed on 12/18/2006 has been entered.
2. Claims 1, 3-7,9-14,16-19 are presented for examination.

### *Response to Arguments*

3. Applicant's arguments filed 12/18/2006 have been fully considered but they are not persuasive.

Applicant's arguments mentions only to .9 volts in claim 1.

Applicant argues as below is improper.

In that appeal brief it was noted that the citation to paragraph 120 of Lowrey is insufficient to meet the claims which talk about a phase change memory element having a voltage greater than .9 volts.

What is being discussed in paragraph 120 is the holding voltage of the select device for the memory element, not the holding voltage of the memory element. Thus, the cited material is of no moment to what is claimed.

Reference Pub. U.S. 2004/0113137 of Lowrey discloses Figure 4 memory cell 100 is a phase change memory in paragraph 0028, *memory 100 may be referred to as a phase change memory.* The phase change memory device 100 in Figure 4 comprising two parts of 120 and 130, which including a phase change material. Although the reference disclosed 120 is a select device but it is a part of a memory cell and it comprises a phase change material as described in paragraph 0033, select device 120 may be two terminal device that may have a current-voltage (I-V) characteristic similar to a phase change memory element. This is enough overcome the claimed invention of present

Art Unit: 2827

application. More specifically, the select device 120 has threshold voltage 1.2 volts and holding voltage is about one volt in paragraph 0120. As described above, the phase change memory element of select device 120 in reference including a holding voltage is at least 80 percent of threshold voltage and greater than *about .9 volts*.

Since the claim of present invention discloses **only** a phase change memory element having a holding voltage is at least 80 percent of threshold voltage of element and holding voltage greater than about .9 volts. Reference including a memory cell comprising a phase change material has condition as present invention claimed. Hence, the prior art of reference overcomes the present invention, and reference 2004/0113137 still stands.

### ***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000.

Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

5. Claim 1, 3-7, 9-14, 16-19 rejected under 35 U.S.C. 102(e) as being anticipated by Lowrey (Pub. U.S. Patent No. 2004/0113137).

Regarding claims 1, 6, Lowrey discloses method and an apparatus (Figure 4) comprising:

forming a phase change memory element having a holding voltage that is at least 80 percent of the threshold voltage of the element and holding voltage greater than about .9 volts ([0120], phase change element has threshold voltage is about 1.2 volts, holding voltage is about 1 volts, it is greater than .9 volts and about 80% of the threshold voltage of element).

Regarding claim 3, 9, 16, Lowrey discloses forming a phase change memory element to have a threshold voltage that does not vary by more than 10 percent with programming currents varying as much as two times ([0032], [0036]).

Regarding claims 4-5, 7, 10, 13-14, Lowrey discloses forming a phase change memory element including a phase change material (Figure 3, 220) between a pair of electrodes (Figure 3, 230, 210, [0037]), and forming a phase change material with a lower electrode of titanium silicon nitride ([0038]).

Regarding claim 6, Lowrey discloses an apparatus (Figure 4) comprising:

a phase change memory element (Figure 4, 130) to be read ([0032]) with a voltage greater than or equal to the threshold voltage of the element and to have a holding voltage that is at least 80 percent of the threshold voltage of element ([0120],

Art Unit: 2827

threshold voltage is 1.2v, and holding voltage is 1 volt, hence the holding voltage at least or more than 80% of threshold voltage of phase change memory element).

Regarding claims 11 Lowrey discloses an apparatus (Figure 20) comprising: a processor (Figure 20, 865) ; and a phase change memory element having a holding voltage that is at least 80 percent of the threshold voltage of the element and holding voltage greater than about 0.9 volts ([0120], phase change element has threshold voltage is about 1.2 volts, holding voltage is about 1 volts, it is greater than .9 volts and about 80% of the threshold voltage of element. Hence, it overcomes present claim invention).

Regarding claims 12, Lowrey discloses the wireless interface including a dipole antenna ([01333]).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thong Q. Le whose telephone number is 571-272-1783. The examiner can normally be reached on 8:00am-5:00pm M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Zarabian Amir can be reached on 571-272-1852. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2827

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

A handwritten signature in black ink, appearing to read 'Thong Q. Le', with a stylized flourish at the end.

Thong Q. Le  
Primary Examiner  
Art Unit 2827

2/6/2007